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CORN AND OATS FOR GROWER DIETS AND THEIR EFFECTS ON SUBSEQUENT REPRODUCTIVE PERFORMANCE

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Previous studies at this station have shown that low protein, low density grower diets are very economical for producing layer-type pullets and that they do not affect subsequent egg production. Supplemental DL-methionine and L-lysine for 12% protein diets have been of no benefit in improving growth rate of subsequent production. This year's study compared 12% protein diets of corn and oats, alone and in combination, with a 16% protein standard corn-soybean grower diet. Table 1 shows the composition of these diets.

Eleven replicates of forty 10-week-old commercial hybrid pullets (Babcock 300) were housed at the rate of 10 birds per cage (61 x 41 cm) and fed the four grower diets until 20 weeks of age. At 21 weeks of age, they were placed in layer cages and reproductive data were collected for ten 28-day periods. During the reproductive phase, a comparison was made (table 2) between 16 and 12% protein diets with and without the supplementation of a probiotic.

Table 3 shows the data from the grower phase of the study. Adding oats to the diet decreased body weight gain somewhat while substantially decreasing feed efficiency. Note, however, that the higher protein level of treatment 4 was of little benefit.

Table 4 shows some of the production data for the reproductive phase of this study. Pullets grown on the 12% protein corn diet produced significantly fewer eggs than those grown on the lower density oat diets. This tendency has been noted in previous studies.

Significant effects noted due to layer diet were that the 16% protein diet supported 3.5% higher production, while supplementation of a probiotic decreased production by 2.5%. Mortality was high during this experiment due primarily to the high incidence of leucosis and cannibalism.

¹ Superintendent, Poultry Research Center, and Professor and Leader, Poultry Research and Extension, respectively.

Table 1. Composition of Grower Diets Used in Caged Pullet Experiment

| | Treatments | | | |
|---------------------|------------|------|------|------|
| | 12% | 12% | 12% | 16% |
| | corn-oats | oats | corn | corn |
| | % | % | % | % |
| Ground oats | 30 | 87 | -- | -- |
| Ground yellow corn | 52 | -- | 80 | 70 |
| Soybean meal | 6 | 1 | 8 | 18 |
| Dehydrated alfalfa | 6 | 6 | 6 | 6 |
| Dicalcium phosphate | 2 | 2 | 2 | 2 |
| Limestone | 1 | 1 | 1 | 1 |
| Salt mix | .5 | .5 | .5 | .5 |
| Vitamin mix | .5 | .5 | .5 | .5 |
| Yellow grease | 2.0 | 2.0 | 2.0 | 2.0 |
| Calculated protein | 12.0 | 12.0 | 12.0 | 16.0 |

Table 2. Composition of Layer Diets Used in Caged Hen Experiment¹

| | Treatments | |
|---------------------|------------|---------|
| | 16% | 12% |
| | protein | protein |
| | % | % |
| Corn | 66 | 81 |
| Soybean meal (48%) | 20 | 9 |
| Alfalfa meal (17%) | 2 | 2 |
| Dicalcium phosphate | 2 | 1.5 |
| Limestone | 5 | 5 |
| Salt mix | .5 | .5 |
| Vitamin mix | .5 | .5 |
| Yellow grease | 4.0 | -- |
| DL-methionine | -- | .15 |
| L-lysine | -- | .20 |

¹ Probiotic supplement no. 2 added to one-half of the groups to give four treatments (340 g/ton).

Table 3. Total Gain and Overall Feed Efficiency for Grower Period (10-20 weeks) of Caged Hybrid Pullets¹

| Treatment | Total gain g | Feed/gain |
|-----------------------|-----------------|-----------|
| 1. 12% corn-oats diet | 689 | 7.25 |
| 2. 12% oats diet | 655 | 7.93 |
| 3. 12% corn diet | 693 | 6.64 |
| 4. 16% corn diet | 711 | 6.61 |

¹ Average of 11 replicates (40 birds per replicate).

Table 4. Effect of Dietary Regime on Production Parameters

| Treatment | Hen-day production ¹ % | Feed per day g | Feed per dozen eggs kg | Average egg wt. g | Final body wt. kg | Hen-housed mortality % |
|---------------------------------|--------------------------------------|-------------------|---------------------------|----------------------|----------------------|---------------------------|
| <u>Grower Diet</u> ² | | | | | | |
| 1. 12% corn-oats | 70.5 | 102 | 1.71 | 61.9 | 1.87 | 15.5 |
| 2. 12% oats | 70.5 | 101 | 1.69 | 61.6 | 1.83 | 18.3 |
| 3. 12% corn | 67.8a ³ | 102 | 1.78 | 62.1 | 1.86 | 16.9 |
| 4. 16% corn | 69.1 | 101 | 1.72 | 61.7 | 1.86 | 19.0 |
| <u>Layer Diet</u> ⁴ | | | | | | |
| 16% protein | 72.9 | 101 | 1.62 | 62.1 | 1.89 | 18.7 |
| 16% protein + probiotic no. 2 | 69.4A | 100 | 1.69a | 62.4 | 1.91 | 18.4 |
| 12% protein | 68.6A | 102 | 1.76A | 61.3A | 1.81 | 16.1 |
| 12% protein + probiotic no. 2 | 67.0A | 103 | 1.81A | 61.6a | 1.80 | 16.4 |

¹ Ten 4-week periods.

² See table 1.

³ Values without a common subscript and variable category are significantly different from control (capital letters = $P < .01$ and small letters = $P < .05$).

⁴ See table 2.